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WO 99/27105

PCT/IB98/01890

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Ile Ser Ile Gly Leu Phe Leu Val Leu Arg Glu Ser Thr Trp Met Val
      35             40             45
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      20             25             30

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Leu Gly Ser Cys Cys Arg Phe Phe Pro Ser Cys Ser His Tyr Ala Glu  
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 Lys Arg Ile Gly Lys Cys Gly Pro Trp His Pro Gly Gly Ile Asp Met  
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 Val Pro Lys Thr Ala Leu Gln Glu Val Leu Glu Pro Tyr Gln Glu Ile  
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&lt;210&gt;6846

&lt;211&gt;79

&lt;212&gt;PRT

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&lt;400&gt;6846

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&lt;210&gt;6847

&lt;211&gt;103

&lt;212&gt;PRT

&lt;213&gt;Chlamydia pneumoniae

&lt;400&gt;6847

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 Lys Pro Leu His Tyr Ile Asn Ala Ile Gly Gly Ser Arg Ser Leu Thr  
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                   50                  55                  60  
 Arg Val Leu Gln Leu Arg Cys Thr Ser Leu Glu Asn Arg Met Tyr Lys  
                   65                  70                  75                  80  
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&lt;210&gt;6848

&lt;211&gt;88

&lt;212&gt;PRT

&lt;213&gt;Chlamydia pneumoniae

&lt;400&gt;6848

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&lt;210&gt;6849

&lt;211&gt;141

&lt;212&gt;PRT

&lt;213&gt;Chlamydia pneumoniae

&lt;400&gt;6849

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      100          105          110
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      115          120          125
Leu Pro His Tyr Tyr Asn His Ser Val Tyr Arg Ser Asn
      130          135          140

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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification <sup>6</sup> : C12N 15/31, 15/62, C07K 14/295, 16/12, 19/00, A01K 67/027, A61K 39/118, G01N 33/53, C12Q 1/68</p>	<p>A3</p>	<p>(11) International Publication Number: <b>WO 99/27105</b> (43) International Publication Date: 3 June 1999 (03.06.99)</p>
<p>(21) International Application Number: PCT/IB98/01890 (22) International Filing Date: 20 November 1998 (20.11.98) (30) Priority Data: 97/14673 21 November 1997 (21.11.97) FR 60/107,078 4 November 1998 (04.11.98) US (71) Applicant (for all designated States except US): GENSET [FR/FR]; 24, rue Royale, F-75008 Paris (FR). (72) Inventor; and (75) Inventor/Applicant (for US only): GRIFFAIS, Rémy [FR/FR]; 51, boulevard Romain Roland, F-92120 Montrouge (FR). (74) Agents: MARTIN, Jean-Jacques et al.; Cabinet Regimbeau, 26, avenue Kléber, F-75116 Paris (FR).</p>	<p>(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).  <b>Published</b> <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims</i> <i>and to be republished in the event of the receipt of amendments.</i>  (88) Date of publication of the international search report: 11 November 1999 (11.11.99)</p>	
<p>(54) Title: <i>CHLAMYDIA PNEUMONIAE</i> GENOMIC SEQUENCE AND POLYPEPTIDES, FRAGMENTS THEREOF AND USES THEREOF, IN PARTICULAR FOR THE DIAGNOSIS, PREVENTION AND TREATMENT OF INFECTION</p> <p>(57) Abstract</p> <p>The subject of the invention is the genomic sequence and the nucleotide sequences encoding polypeptides of <i>Chlamydia pneumoniae</i>, such as cellular envelope polypeptides, which are secreted or specific, or which are involved in metabolism, in the replication process or in virulence, polypeptides encoded by such sequences, as well as vectors including the said sequences and cells or animals transformed with these vectors. The invention also relates to transcriptional gene products of the <i>Chlamydia pneumoniae</i> genome, such as, for example, antisense and ribozyme molecules, which can be used to control growth of the microorganism. The invention also relates to methods of detecting these nucleic acids or polypeptides and kits for diagnosing <i>Chlamydia pneumoniae</i> infection. The invention also relates to a method of selecting compounds capable of modulating bacterial infection and a method for the biosynthesis or biodegradation of molecules of interest using the said nucleotide sequences or the said polypeptides. The invention finally comprises, pharmaceutical, in particular vaccine, compositions for the prevention and/or treatment of bacterial, in particular <i>Chlamydia pneumoniae</i>, infections.</p>		

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DK	Denmark	LR	Liberia	SG	Singapore		
EE	Estonia						

# INTERNATIONAL SEARCH REPORT

International Application No

PCT/AB 98/01890

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 C12N15/31 C12N15/62 C07K14/295 C07K16/12 C07K19/00  
A01K67/027 A61K39/118 G01N33/53 C12Q1/68

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 C07K C12N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	PEREZ MELGOSA M ET AL: "Isolation and characterization of a gene encoding a Chlamydia pneumoniae 76-kilodalton protein containing a species-specific epitope." INFECT IMMUN, MAR 1994, 62 (3) P880-6, XP002076845 UNITED STATES abstract page 880, right-hand column, paragraph 3 -page 881, left-hand column, paragraph 1 --- -/--	1-3,7,9, 11,13, 26,27, 30,44, 45,48

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

### \* Special categories of cited documents :

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- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

- \*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- \*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- \*Z\* document member of the same patent family

Date of the actual completion of the international search

3 June 1999

Date of mailing of the international search report

17.09.99

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Gurdjian, D

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# INTERNATIONAL SEARCH REPORT

International Application No  
PCT, .B 98/01890

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	TOMB J -F ET AL: "THE COMPLETE GENOME SEQUENCE OF THE GASTRIC PATHOGEN HELICOBACTER PYLORI" NATURE, vol. 388, no. 6642, 7 August 1997 (1997-08-07), pages 539-547, TABEL, XP002062106 the whole document	1-3,7,9, 11,13, 26,27, 30,44, 45,48
A	--- KORNAK JM ET AL: "Sequence analysis of the gene encoding the Chlamydia pneumoniae DnaK protein homolog." INFECT IMMUN, FEB 1991, 59 (2) P721-5, XP002076846 UNITED STATES abstract page 724	1
A	--- WATSON MW ET AL: "The CrP operon of Chlamydia psittaci and Chlamydia pneumoniae." MICROBIOLOGY, OCT 1995, 141 ( PT 10) P2489-97, XP002076847 ENGLAND abstract page 2942 -page 2943	1
A	--- LOBAU S ET AL: "Molecular cloning, sequence analysis, and functional characterization of the lipopolysaccharide biosynthetic gene kdtA encoding 3-deoxy-alpha-D-manno-octulosonic acid transferase of Chlamydia pneumoniae strain TW-183." MOL MICROBIOL, NOV 1995, 18 (3) P391-9, XP002076848 ENGLAND abstract	1
A	--- PETERSON EM ET AL: "Characterization of the murine antibody response to peptides representing the variable domains of the major outer membrane protein of Chlamydia pneumoniae." INFECT IMMUN, AUG 1996, 64 (8) P3354-9, XP002076849 UNITED STATES abstract	1
A	--- EP 0 784 059 A (HITACHI CHEMICAL CO LTD) 16 July 1997 (1997-07-16) claims 1-45 --- -/--	1

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Invention 1 : claims 1-3 and 7,9,11,13,26,27,30,44,45,48 (partially)  
nucleotide seq.id.n.1 coding for the genome of  
Chlamydia pneumoniae, corresponding vector, host, method of  
detection, DNA chip, screening assay and kit.

Invention 2 : claims 4-56 (partially)

ORF2 of Chlamydia pneumoniae, fragments, corresponding  
polypeptides, nucleotide sequences, DNA chip, cloning  
vector, host, method for producing polypeptides, fusion poly-  
peptide, method for the detection, kit, antibody, immunogenic  
and pharmaceutical composition, screening assay.

Inventions 3-1297 : identical to invention 2, but applied to orf3-1297, in  
which invention 3 is limited to ORF3, invention 4 to ORF4, etc..  
until invention 1297 that is limited to ORF1297.

# INTERNATIONAL SEARCH REPORT

ii nation on patent family members

International Application No

PCT, .B 98/01890

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0784059 A	16-07-1997	AU 685680 B	22-01-1998
		AU 3532995 A	09-04-1996
		WO 9609320 A	28-03-1996
		JP 8143594 A	04-06-1996
		JP 9009974 A	14-01-1997
		JP 9009976 A	14-01-1997
		JP 9009999 A	14-01-1997
		JP 9015243 A	17-01-1997
		JP 9015244 A	17-01-1997

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# INTERNATIONAL SEARCH REPORT

International Application No  
PCT, .B 98/01890

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
T	<p>"http://www.ncbi.nlm.nih.gov/cgi-bin/Entrez/fragments?db=Genome&amp;gi=140"</p> <p>KALMAN S. ET AL., December 1998 (1998-12), XP002104860</p> <p>page 1 -page 2</p> <p>-----</p>	<p>1-3,7,9, 11,13</p>

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# INTERNATIONAL SEARCH REPORT

International application No.

PCT/IB 98/01890

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:  
Remark: Although claims 40-43  
are directed to a method of treatment of the human/animal  
body, the search has been carried out and based on the alleged  
effects of the compound/composition.

2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such  
an extent that no meaningful International Search can be carried out, specifically:

3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all  
searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment  
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3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report  
covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is  
restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

claims 1-3 and 7,9,11,13,26,27,30,44,45,48 (partially)

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

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